VALUE

AND

ITS MEASUREMENT

A Dissertation submitted to the Board of University Studies of the Johns Hopkins University for the Degree of Doctor of Philosophy

BY

D. I. GREEN

VALUE AND ITS MEASUREMENT.

DR. FRIEDRICH VON WIESER says that "in economy value decides everything."[1] It is the controlling force in industrial life, determining in what direction labor and capital shall be expended, and in what proportion the products of industry shall be divided. The theory of value, therefore, must be the foundation of economic science, and as the main volume of economic study passes over from the methods of logic to the methods of natural history—the investigation of actual phenomena,—some change in the conception of value is to be expected.

Professor Patten describes[2] the progress of economic thought from the exclusive consideration of physical environment on the part of the Physiocrats, through the various stages of transition to the present tendency to make the differences in the wants and actions of men the corner-stone of economic theory. This increased consideration of the human element is causing a change in the idea assigned to the word value by economic writers.

The old method of regarding wealth as the result of physical environment, and of measuring it in terms of commodities, led to an abstract science, and economic terms were robbed in part of that personal color and life which they have retained in popular usage. Value has been commonly defined as "the ratio of exchange between commodities," or "purchasing power." If a bushel of wheat exchanges for a hat, each is said to express the value of the other, and, to tell whether any object has risen in value, we must simply ascertain whether it exchanges for more of other things than it did before. On the other hand, in popular language value is more directly connected with human feeling. Anything is valuable which satisfies want and cannot be replaced without effort or sacrifice. The more

[1] *Economic Journal* for March, 1891.

"Wie man über den Werth urtheilt, muss man aber, wenn man folgerichtig bleibt, letztlich über die Wirthschaft urtheilen."—*Der Natürliche Werth*, p. vi.

[2] *Theory of Dynamic Economics.*

urgent the want whose satisfaction is dependent upon a particular object, the greater is the value of the object. Economic theory has maintained that a dollar has the same value to one man as to another so long as it purchases the same amount of goods, while everyone has an instinctive sense that a dollar is more valuable to a poor man than to a millionaire.

Professor Perry noticed the difficulty arising from this disparity, but saw no remedy for it. He says:[1]

"The notion of value is not conceivable except by a comparison of two things, and what is more, of two things mutually exchanged. Political Economy, therefore, is based on a relative idea, and has to do from beginning to end with a relation. Now in this there is an inherent difficulty, and a difficulty too which can never be obviated. It lies in the very nature of the subject. Men much more readily apprehend an absolute idea than a relative one. They more easily follow a discussion touching the independent attributes of single objects . . . than a discussion touching value, which is not an attribute of any one thing, but a relation subsisting between two things."

Grant that value is merely the ratio of exchange and we have for the foundation of economic theory only unstable commodities for each of which our esteem is constantly changing; fluctuating with every change of environment, and with every step of progress.

This colorless concept of value as a mere relation between commodities was not established by the founders of modern economic theory, and its introduction has been, I believe, a hindrance to the progress of economic science rather than a necessary step in its development. Adam Smith recognized that the values of commodities are essentially variable, and looked for a standard of value which would have a constant relationship to human well-being. This standard he found in human labor:

"What everything is really worth to the man who has acquired it, and who wants to dispose of it or exchange it for something else, is the toil and trouble which it can save to himself, and which it can impose upon other people." The

[1] *Elements of Political Economy*, p. 54.

employer purchases labor "sometimes with a greater and sometimes with a smaller quantity of goods, and to him the price of labor seems to vary like that of all other things. It appears to him dear in the one case and cheap in the other. It is the goods which are cheap in the one case and dear in the other."[1]

Ricardo, at the opening of his discussion, accepts Adam Smith's definition of value in exchange of an object as "the power of purchasing other goods which the possession of that object conveys,"[2] but like Adam Smith he at once discards the commodity standard in estimating the goods:

"If any one commodity could be found which now and at all times required precisely the same quantity of labor to produce it, that commodity would be of an unvarying value, and would be eminently useful as a standard by which the variations of other things might be measured."[3]

"The labor of a million of men in manufactures will always produce the same value, but will not always produce the same riches." . . . .

"That commodity is alone invariable which at all times requires the same sacrifice of toil and labor to produce it."[4]

Malthus was still more clear and emphatic in his rejection of the commodity standard of value. A change in purchasing power, he maintains, is not a change in value unless it arises from causes intrinsic with the article under consideration:

"It has often been stated that the value of a commodity is determined by the sacrifice which people are willing to make

[1] *Wealth of Nations*, Book I, chap. 5.

[2] *Wealth of Nations*, Book I, chap. 4. Ricardo's *Political Economy*, chap. i, sec. 1.

The statement that value in exchange is "the power of purchasing other goods" does not define the term. If the "other goods" for which the object exchanges are reckoned simply by number and size the definition seems meaningless, for there is no limit to the number of different things for which a valuable object may be exchanged. But if, as seems often to be vaguely understood, the "other goods" are to be estimated not by their number but by their values, we find the term which we wished to define involved in the definition.

We must either look deeper for the real meaning of value or accept the ratio concept.

[3] *Political Economy*, chap. i, sec. 1.

[4] *Political Economy*, chap. xx.

in order to obtain it. . . . It is obvious, therefore, that the sacrifice which we are willing to make in order to obtain a particular commodity is not proportioned to the quantity of any other commodity for which it will exchange, but to the difficulty with which such quantity, whether more or less, is attained. Now labor can measure this difficulty, but nothing else can."[1]

Malthus, like Adam Smith, looked upon exchange value as a token of subjective estimation, and sought for a standard by which the value of commodity (e. g. the monetary unit) at different times and places could be measured and compared. The command over labor, of which the ordinary agricultural labor should be the unit, was considered the most exact standard.

Ricardo, on the other hand, disregarded the subjective nature of value and directed his efforts to the explanation of the relative values of commodities. On the ground that commodities tend to exchange on the basis of the amounts of labor which they embody, Ricardo took the labor necessary for the production of a commodity as the foundation and therefore the measure of its value. Just what Ricardo meant by measure of value is by no means clear; but his position toward the value problem prevailed among English economists, and soon led to the ratio concept as set forth by Mill and his followers, who declared values to be entirely relative to each other, and a general rise or a general fall in values, therefore, to be logically impossible. To speak simply of the value of an ounce of gold, says Jevons, is as absurd as to speak of the ratio of the number seventeen. Mill seems to have been more acute than the most of his followers when from his definition of value he deduces[2] the fact that a "measure of exchange value" is "impossible";

[1] *Definitions in Political Economy*, pp. 211, 212.

"Intrinsic value in exchange, which may be defined to be the power of purchasing arising from intrinsic causes, in which sense the value of an object is understood when nothing further is added. This definition is precisely equivalent to the estimation in which a commodity is held, founded on the desire to possess, and the difficulty of obtaining possession of it."—*Political Economy*, 2d edition, p. 60.

[2] *Political Economy*, Book III, chap. xv.

for if the value of an ounce of gold, e. g., has no existence as an independent magnitude and appears as something different as often as we change the object with which the gold is compared, how can the value of the ounce of gold either be measured or serve as a measure of other values?

It seems strange that a definition of value so devoid of content could have become so generally accepted by writers of text-books; and it is not surprising that economic writers have never been in the habit of confining their use of the term value to the meaning given in their definition.[1]

While the earlier economists gave value an absolute meaning through its relation to labor sacrifice, recent economic theory escapes from the inane ratio concept upon the side of utility. Jevons says:[2]

"I have pointed out the excessive ambiguity of the word value, and the apparent impossibility of using it safely. When

[1] Cournot defines value as wholly relative, yet his treatment of the subject shows that his concept retains an absolute element.

"To sum up, there are only relative values; to seek for others is to fall into a contradiction with the very idea of value in exchange, which necessarily implies the idea of a ratio between two terms. But also an accomplished change in this ratio is a relative effect, which can and should be explained by absolute changes in the terms of the ratio. There are no absolute values, but there are movements of absolute rise and fall in values. Among the possible hypotheses on the absolute changes which produce the observed relative changes there are some which the general laws of probability indicate as most probable."—*Mathematical Principles of the Theory of Wealth*, p. 24.

Let us suppose that three pecks of wheat exchange for five pecks of corn. The fraction $\frac{3}{5}$ expresses the ratio of exchange between them. If later four pecks of wheat exchange for sevens pecks of corn the new ratio will be $\frac{4}{7}$. Here is what Cournot calls a relative rise in the value of wheat in respect to corn, and Cournot submits that the rise is to be explained by an absolute change in the value of one or both of the articles compared. Perhaps the exchange of wheat with oats, wool, nails, apples, silver, and various other articles will show a relative rise in the value of wheat in respect to all of them; but, however extended our observation, we could find evidences of only a relative rise in the value of wheat in respect to the other goods. If values are nothing but relations in exchange, changes in value must all be relative. To speak of an absolute rise in the value of wheat implies that value is an absolute attribute capable of increase or decrease without regard to the value of other articles.

Grant that value is an attribute of things, such as importance for satisfying human wants, and we at once understand how the ratios of exchange vary with the variations in the absolute values of the articles exchanged. Cournot himself speaks of "the absolute value of the monetary metals" in the same chapter in which he says that there are no absolute values, and in his later works the term absolute value is repeatedly used.

[2] *Theory of Political Economy*, 3d edition, p. 162.

intended to express the mere fact of certain articles exchanging in a particular ratio, I have proposed to substitute the unequivocal expression—*ratio of exchange*. But I am inclined to believe that a ratio is not the meaning which most persons attach to the word value. There is a certain sense of esteem or desirableness, which we may have with regard to a thing apart from any distinct consciousness of the ratio in which it would exchange for other things. I may suggest that this distinct feeling of value is probably identical with the final degree of utility. While Adam Smith's often-quoted *value in use* is the total utility of a commodity to us, the *value in exchange* is defined by the *terminal utility*, the remaining desire which we or others have for possessing more."

The Austrian economists, whose enlightening analysis of value has modified the thought of every economist of the day, have essentially the same idea of value as that described by Jevons as the popular meaning of the term. Menger says, the value of goods is "the importance which concrete goods, or quantities of goods, receive for us from the fact that we are conscious of being dependent on our disposal over them for the satisfaction of our wants."[1]

The primary idea in value is that of importance for the satisfaction of our wants. It is utility limited by the sacrifice of substitution.

Would an article in possession, if removed, be replaced without sacrifice, like the air in a closed room? The measure of its value is nothing. Would it be replaced at some sacrifice? Its value is gauged by the sacrifice. Would an imperfect substitute take its place? Its value is gauged by the two-fold sacrifice entailed.[2]

[1] Quoted by Wieser, *Natural Value*, p. 21. Prof. von Philippovich (*Grundrisz der Politischen Oekonomie*, 2d edition, p. 6) says: "Der Werth der Güter ist die Bedeutung, die wir ihnen zuerkennen mit Rücksicht darauf, dasz wir unsere Bedurfniszbefriedigung und daher unsere Wohlfahrt von ihnen abhängig wissen."

Prof. Marshall recognizes the subjective and absolute nature of value when he says (*Principles of Economics*, p. 208): "The more a person spends on anything the less power he retains of purchasing more of it or of other things, and the greater is the value of money to him.

[2] This illustration is taken from Professor Clark's *Philosophy of Wealth*, chap. 5, with the word *value* substituted for *effective utility*.

In these days of interdependence, when every one has in some way hired out his services to his neighbors while supplying his own wants by purchases with the money he gets, it is evident that the values of the most of our exchangeable commodities to us will correspond to the market prices of such commodities, for those prices represent the sacrifices which would be required to replace them. So important are market prices in determining values to individuals, that we very commonly use the word value to denote simply the amount of money which we would have to give for the object in view, or the amount of money for which it would sell.

The forces which influence merchants and other sellers in determining prices, and through prices the values of things to individuals, must be considered under the theory of prices, but our present concern is rather with the unit of value.

Our dependence upon the market for the supply of our wants makes the monetary unit an exceedingly convenient unit of value. (1) It is definite and familiar to all as the constant medium of exchange; (2) it is readily divided or multiplied to express any degree of value; and (3) it equates the personal element, and expresses values in terms adapted to the purpose of exchange.

To illustrate the last point, let us picture to ourselves a rich man, a poor man, and a pet dog. Perhaps the poor man would make a great sacrifice to keep the dog, while the rich man cares but little for it. That, however, is a personal valuation, and does not indicate which man will have the dog. But if the poor man considers it worth five dollars to him, while his more fortunate neighbor is ready to pay six dollars for it, the dog is pretty sure to fall to the rich man. The valuations in units of money are the terms from which the ratios of exchange are determined. Under the present social order the commodity goes to the one who will pay most for it, but, owing to the inequality among men, this is not always the one who wants it most.

The amount which I am willing to pay for a favorite picture depends not only upon the importance of the picture to me as a

source of gratification, but also upon the importance of a dollar to me.[1]

When we speak of the value of a house, or of a cow, we usually refer to the number of dollars that it is worth, but we have no conception of its real value to the owner till we know his estimation of a dollar—the amount of pleasure or hardship that depends upon its possession.[2] Values always originate and derive both their meaning and their amount from such considerations of human well being, though the coloring is largely lost by expressing them in terms of dollars and cents. Back of all money values lie personal values, and money values cannot be explained till the nature and laws of personal values have been discovered.

But how may the value of the monetary unit to different individuals be revealed and measured? Two methods are contending for our acceptance, one looking to the utility of the dollar, the other to its cost. Suppose a man to spend his income, dollar by dollar, purchasing goods in the order of their importance to him. The utility of the last dollar's worth would determine the value of money to him, for that would be the satisfaction which the loss of any dollar would intercept. On the other hand, most people earn money, or at least save it, by fatiguing, or otherwise disagreeable labor. If they value a dollar highly

[1] "For the price which the various purchasers in a market will pay for a thing, is determined not solely by the final degrees of its utility to them, but by these in conjunction with the amounts of purchasing power severally at their disposal."—Marshall, *Principles of Economics*, 3d edition, p. 562.

[2] When we say that this article is worth two dollars and that article is worth five, we do not consider the fact that a dollar has a very different value to different people—nor do we deny the fact.

Values expressed in terms of the monetary unit are called objective values because the unit is objective. The values themselves are subjective and must vary in the same ratio that the unit varies when referred to different people.

Prof. Newcomb calls my attention to Laplace, who, in his introduction to the *Théorie Analytique des Probabilités*, 1814, sets forth the fact that the value of the franc increases as one's possessions decrease, so that the chance of losing a sum of money is not fully offset by an equal chance of gaining the sum.—Laplace, *Oeuvres*, Vol. vii, pp. xxi, xxii. Laplace refers to Daniel Bernouilli, also cited by Prof. Marshall, who considered that the relative values of an increment of wealth to different individuals would be indicated by the quotients obtained by dividing the increment by the amount of wealth possessed by each individual.

they will prolong their labor till it becomes decidedly burdensome, but if they place a low estimate upon the money earned they will stop when the sacrifice of continuing would be slight. One naturally works till the pleasure to be derived from the possession of another cent is just offset by the displeasure of earning it, and of course one values every cent in his possession at the same rate. The sacrifice involved in the earlier hours of labor does not indicate the value of the earnings, for a dime lost can be replaced only by extending the period of labor.

It is not easy to determine whether the importance of a dollar to its possessor is best revealed by referring to the additional satisfaction that it will give or to the displeasure which its possession will save. So far as people regulate their actions with reason the two methods would give equivalent results, for it is not reasonable to endure a hardship for money unless the money received will yield a satisfaction equal to the hardship, nor is it reasonable to shun a hardship until it has become equal to the additional pleasure to be derived from the money which it yields.

It may be claimed that the utility method is of more universal application than the cost method, for so far as labor sacrifice is concerned, many people have fixed incomes, fixed hours of labor, or fixed habits of life which interfere with the natural limitation of the period of labor and thus thwart the natural equivalence between the final labor sacrifice and the utility of the final earnings. The music teacher would be glad to give more lessons at the same rate per hour, and more calls would be acceptable to the physician. On the other hand, nearly everyone, either in his regular occupation or outside of it, is often called upon to decide whether the sacrifice involved in continuing work equals the utility of the money to be gained or saved; in other words, to decide whether it will pay to work any longer; and there is reason for the belief that sacrifice and hardship are more definite and capable of estimation than pleasures.[1]

[1] Prof. Edgeworth and Prof. Böhm-Bawerk, in the *Economic Journal* (Sept. and Dec. 1894), discuss the question whether there is a general tendency for the market values of commodities to correspond to the final disutility of the labor which produces them. Both seem to agree that there is such a tendency to the extent "that the laborer is perfectly free both to change amongst the different occupa-

No attempt, I think, has ever been made to establish a unit of subjective pleasure, but on the side of hardships the labor unit has often been proposed. Apart from any special consideration of the burdensomeness of the last moments of a labor period, a day's labor, or an hour's labor, may be taken as a unit of sacrifice, though it is necessarily inaccurate. Let us return to the comparison of the rich with the poor man. Suppose them to be in equal physical condition and both caught in a storm at a distant station. If not moved by selfish considerations, you will as readily lend your umbrella to one as to the other. It will be an equal service to either. If, however, you wish to make money on your fortunate possession, the poor man may tell you that the use of the umbrella would not be worth twenty-five cents to him, though the rich man would be glad to use it even if you charged him two dollars for the favor. But if instead of money you should ask an hour's labor for the use of the umbrella the two men might be placed upon an equality again.

tions and to vary the length of the day's work," but the Austrian economist considers that there is not sufficient economic freedom to make this law of disutility-cost operative in any general way.

It does not appear that either author has the fact sufficiently in mind here, though I am sure the idea is not new to them, that the final disutility of labor is an individual matter, and may not be the same for any two workmen who produce the same commodity, though all receive the same pay for their final labor sacrifice. It is the individual's estimate of the final earnings that equals the individual's estimate of the final labor sacrifice at the moment when he chooses to stop work. If we wish to find one's estimate of money in terms of disutility where the length of the labor day is fixed by other considerations, we may look for it as well in his activity outside his regular employment.

It should be observed in this connection that there is no direct relationship between the final utility of hats, for instance, and the final disutility of the labor day on the part of the hatmakers. The equivalence is between the final disutility of the labor of each hatmaker and the final utility to him of the commodities which he can buy with his earnings. A hard working needle-woman prolongs her labor till its disutility approaches the limit of endurance, because the final utility to her of money and commodities is correspondingly high, but, unfortunately for her, she cannot impart this high scale of valuation to the product of her labor in the market.

Whatever tendency there may be for prices to conform to disutility cost, it is greatly and permanently disturbed by differences in economic opportunities. See an article entitled "Pain-cost and Opportunity-cost," *Quarterly Journal of Economics*, Jan., 1894; and an article by Prof. Böhm-Bawerk, on "The Ultimate Standard of Value," *Annals of the American Academy*, Sept. 1894.

But to the commercial world this personal unit of value is of less importance than the generalized unit which, like the dollar, will serve to measure, under a system of one price to all, the comparative value of different things to everyone, though it necessarily fails to indicate the relative values of the same thing to different people.

The monetary unit has a new significance when taken as the standard of deferred payments. We have found the dollar to represent very different values to different individuals, but while this is true it might be possible for the value of a dollar to remain constant from decade to decade when referred to people of a given economic condition; or, without any direct reference to its personal importance, the dollar might remain from decade to decade constant in its general purchasing power. In which case would the dollar be a just standard of deferred payment—which condition would give the honest dollar?

The progress of industrial development is constantly facilitating the production of commodities. Methods are being improved, new resources discovered, and organization is becoming more perfect. If the decrease in the cost and increase in the quantity of goods causes a fall in their personal values, ought the dollar also to fall in value and thus remain constant in purchasing power? Or if, on the contrary, the general social development, the increased variety of consumption, and the widening of the circle of wants, should increase the marginal cost, the marginal utility, and thus the personal valuation of commodities, ought the dollar also to rise in value and retain a constant power in exchange? Or would it be more just in either case for the monetary unit to remain constant in value, though its ratio to commodities might change?

It may be claimed with reason that the verdict of justice would depend largely upon the contract made between the debtor and creditor. The market rate of interest would be raised or lowered if the contracting parties expected the principal itself to fall or rise in value. A depreciating money unit would be balanced by a higher rate of interest, and the conditions of the contract should be fulfilled. On the other hand, it may be said that the future changes in the value of the mone-

tary unit are so uncertain that they are very imperfectly represented in the rate of interest upon long time loans.[1]

The question involves many difficulties. Prof. E. A. Ross[2] says all agree "that economic justice consists in the exchange of equal values," though he himself abandons that position if marginal utility be accepted as the criterion of value; and the late Mr. L. S. Merriam[3] said that "the justice of the debtor's repaying to the creditor a value equal to the value received need not to be defended, as it is seldom seriously assailed." Mr. Merriam adhered consistently to the final utility conception of value and regarded that as the ideal money which remains constant in final utility to society, so that the monetary unit should always represent the same amount of marginal utility or real importance for the well-being of society. Mr. Merriam admitted that such a constant unit is chimerical, yet as an ideal standard it is well to form a clear conception of its meaning.

What then is this final or marginal utility to society which seems to be the criterion of social value? If society, like an individual, should use its total income unit by unit in supplying first its most urgent wants and then those of less urgency in order, it is evident that the last units of income would have a utility which would represent the importance or value of each of the units of the income. Then the idea of value based upon the final utility to society would have a definite subjective meaning. But the problem is not so simple. Society does not satisfy the wants of her members in the order of their urgency, but is always partial to those members who can give most in return for her favors. We have noticed that, owing to differences in income and in wants, the marginal utility of a dollar to one man is far ahead of that to another man. While this is

[1] Prof. Irving Fisher (*Appreciation and Interest*, Publications of the American Economic Association, Vol. xi, No. 4) has considered this question most fully and shows by a statistical study that "rising and falling prices and wages are directly correlated with high and low rates of interest," but that "the adjustment of interest to price movements is inadequate."—p. 75.

See also Marshall, *Principles*, 3d edition, pp. 673, 674; J. B. Clark, *The Gold Standard in Recent Theory*, Political Science Quarterly, Sept. 1895; and Pareto, *Cours d' Economie Politique*, sections 116, 117, 387.

[2] *The Annals*, Oct., 1892.

[3] *The Annals*, Jan., 1893.

so, marginal utility to society can hardly have any definite meaning.

When it is said that the value of a dollar to society should remain constant we may well ask: To what part of society? It is quite possible for its value to increase generally in respect to one class though remaining constant, or decreasing, to another class. In our efforts to regulate the value of the monetary unit should we consider the rich or the poor, the creditor or the debtor; or should we take a general average of all? If a general average is chosen, upon what principle should the average be made?

So far as I know, the only attempt to arrive at a subjective unit of value by a combination of all the individual standards is that of Professor Clark,[1] who considers "the pain suffered by society as a whole in the final periods of daily labor" as the ultimate unit of value.

It has now been over twenty years since Jevons and Menger set forth the relation of value to final utility, and writers upon economic theory have long been busy in formulating the laws of subjective value; but Professor Clark has taken the lead in deducing a subjective unit of exchange value. Let us therefore give somewhat detailed consideration to Professor Clark's conception.

In order to understand this conception of the unit of value we must remember that Professor Clark includes under the pain of the final period of labor not only the positive discomfort of the final labor of the day, but also the other sacrifices, such as foregoing the pleasures which continuing work prevents. Thus the pain of the final labor is supposed to equal the additional pleasure to be derived from the final earnings, and final disutility becomes equal to final utility at the point of time when one chooses to stop work.

Granting this equality, let us consider how this unit of "the pain suffered by society as a whole in the final periods of daily labor" is composed. Unfortunately Professor Clark is not clear upon this point. He expresses the unit as the sum obtained by adding together the personal disutility experienced

[1] The Ultimate Standard of Value, THE YALE REVIEW, Nov., 1892.

by each member of society at the point of time when he chooses to stop work, but when one attempts to give a definite meaning to the conception a question arises in regard to the character of the final increments of disutility. Shall they be for equal infinitesimals of time, or for equal infinitesimals of earnings? In other words, shall we add together the disutility which each one experiences from, say the last minute of the day's labor, or should we rather take the disutility involved in earning, say the last cent of the day's wages?

The former method would give a unit which would obviously be of little use as a standard of value. In the first place, we have no assurance that the sum of disutility would remain constant, for the development of the arts of production tends to lower the marginal disutility of labor, while the increased variety of consumption and the development of new wants tend to keep people at work till the marginal disutility is high. These two tendencies may or may not exactly offset each other. If they do not, the standard of value is not constant. In the second place, there is practically no means of comparing such a unit of value with the monetary unit, so long as the final minute of labor represents very different earnings for different persons.

Professor Clark says, "The price of things corresponds to the pain of acquisition, of which the unit is the sacrifice entailed on society by the work of the final minute in each of a series of days." So long as one man can earn a dollar in the final minute of the day's labor while for another man the final minutes of three hundred days are required, how can we determine the relation between a dollar and this final minute disutility to society in general?

If we could add together the earnings of every member of society for the final minute of the day's work and divide by the number of members, an average would be reached which might be taken as an index of the relation between the monetary unit and the final increment of labor. Then if we could find the average disutility of the final minute of labor and compare this average disutility of final labor with the average earnings of the final labor, we could ascertain an average value of the monetary

unit.[1] But how can this average disutility of the final minute of labor be estimated or measured?

From this standpoint we see the weakness of Professor Clark's unit, if we propose to use it practically as a standard of value.[2] We still have no unit of disutility in terms of which we can say that this man's final minute of labor costs him three units while this other man suffers four units. Without some means of measuring and comparing these subjective disutilities it is impossible to determine the average disutility of final labor, which, in turn, is a requisite for determining the average subjective value of a dollar.

But instead of taking the final increments of labor for equal increments of time, let us see if a better result can be reached by considering the disutility involved in securing the last increment of the day's earnings. Our unit of personal disutility will be that of earning the last cent rather than that of working the last minute. If we could add these final disutilities as experienced by each member of society respectively, and divide by the number of members, we should at once arrive at the average value of a cent to society.

But here again we meet with the difficulty of expressing the subjective feelings of different people in terms of a common subjective unit. We have no means of adding these disutilities because other people have no means of accurately telling us the amount of disutility which they experience. It may be said, however, that this practical difficulty of measurement need not interfere with a purely theoretical study. We should first determine what the true unit of value would be and then meet the obstacles to its attainment as best we can. Let us consider then whether this second method of averaging final labor sacri-

[1] Should this average value of a dollar remain constant it might still be an unjust standard of deferred payments, because in forming the average according to the above method a wealthy man has more weight than a poor man.

Should a hundred railway presidents double the money earnings of their final labor, the average value of a dollar as obtained above would decrease much more than when a hundred switchmen doubled their final earnings. The greater weight of large incomes in determining the average earnings of the final minute of labor is not fully compensated by the greater weight of the poorly paid labor in determining the average disutility of the final labor.

[2] It should be said that Prof. Clark does not indicate that his unit of value was designed for such use.

fice would give us a true standard of value if the indicated computations could be made.

Let us grant that the disutility experienced at the time one chooses to stop work is a true index of his valuation of the earnings, and is equal to the final utility of the earnings. Then add together the disutilities experienced by all the members of a society in attaining the last cent of their daily earnings. Multiply this sum by one hundred, and divide by the number of the members in the society. The result will be the average value of one dollar to the people involved. If similar calculations made in succeeding years and decades gave the same average disutility, we could say that the average value of a dollar had not changed. Would this then be the ultimate standard of social value? Would it also be the just standard of deferred payments?[1]

To the former question an affirmative answer seems necessary, for inasmuch as the value of a dollar must vary with the individual we can only take an average to represent the value to society as a whole; and when the average is taken according to this method, any change in the value of a dollar to one person will affect the result just as much as an equal change on the part of any other member of society, whether rich or poor.[2]

[1] Léon Walras (*Éléments d' Économie Politique Pure*, 2d edition, p. 125) proposes to take the arithmetic mean of the marginal utilities of an object to the different members of a society to represent the marginal utility of the object to the society, but (p. 432) instead of having this average marginal utility of the standard of value remain constant, he would have it rise or fall with the marginal utilities of other commodities, so that average prices would remain constant.

Walras' successor at Lausanne, Prof. Pareto (*Cours d' Économie Politique*, sec. 386), prefers to take the harmonic mean of the marginal utilities of gold to each individual to represent the marginal utility of gold to society, but (sec. 390) he does not recognize that the best interests of society require either that average prices or the average marginal utility of money should remain constant.

[2] Let society be represented by ten men of whom two have incomes of $10 a day, three have incomes of $5 and five have incomes of $2 a day. Eliminating personal differences, we may assume roughly that each man's estimate of money will be represented by the reciprocal of his income, and $\frac{1}{10}+\frac{1}{10}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}$ divided by 10, or the fraction $\frac{33}{100}$, represents the average valuation of a cent. These fractions may represent the time required by the respective individuals to earn a cent, or if you please, they may represent the number of groans which a cent would offset. Now it is evident that a change of a second of labor time or of one groan in the estimation of the cent on the part of one of these individuals will have the same effect upon the average valuation that an equal change on the part of any other of the individuals will make.

The question in regard to a just standard of deferred payments is not so easily answered. When one rich man accommodates another with the loan of a hundred dollars, the sum is of little account to either; but if, while the debt is unpaid, both men become poor the hundred dollars comes to embody a much greater value to both men, and, from the standpoint of personal value and sacrifice, the repayment of five or ten dollars might justly cancel the original obligation. But if, for instance, the creditor has grown richer while the debtor has become poor, such an equalization would be impossible. Either one man would be obliged to repay more (in personal value) than he had received, or the other would have to accept much less than he had parted with. The dollar which has increased in value to one has decreased in value to the other.

In cases where the relative economic condition of the contracting parties has changed while a debt is standing, there seems to be no way of attaining ideal justice; and expediency doubtless justifies the present custom of holding a debtor, except in cases of bankruptcy, to the payment of the same number of dollars which he has borrowed, irrespective of their importance to either party.[1]

No attempt is made to adjust debts to the personal standard of the individual, but the attempt is often made so to regulate the currency that the dollar may embody a constant amount of value to society in general. Much of the discussion of the currency question would be less vain if the disputants had a clear conception of what is meant by constant value. Relying upon the definitions of value as the ratio of exchange, or power in exchange, many writers have taken the ground that constant value to society would mean constant purchasing power, but the rapid progress of industrial development is making so great changes in man's relation to commodities that the theorist is

[1] In fact, as Prof. Fisher observes (*loc. cit.* p. 90), "the phenomenon of borrowing and lending is to some extent itself a consequence of the different degrees in which money appreciates or depreciates to borrower or lender." A person who expects to need money in the future more than now, lends to one whose greater need is present. The exchange is profitable to both parties on account of the unlike changes in the subjective values of money to them. The undeserved losses in transactions of debt and credit, as in other lines of business, come from the value changes which cannot be foreseen.

turning naturally to the deeper significance of value. It is found to be subjective in its nature, and evidently the ultimate standard of value must be a subjective standard.[1]

The principle of marginal utility, as measured in terms of personal gratification or in terms of the disutility of final labor sacrifice, gives us the rule for measuring values upon the part of the individual, and the modern conception of society as the social organism has led to the application of the same principle to the determination of social values, and the expressions "final utility to society" and "final labor sacrifice of society" are brought into economic literature.

When all values are expressed in terms of the unit of exchange, this principle of final or marginal utility is, doubtless, the chief force in the determination of prices and must figure largely in the theory of prices.[2] But, as we have already seen, when we attempt to ascertain the real value of the monetary unit itself, we find that the conception of a final utility to society will not bear inspection. The final utility of the dollar or the cent varies with each individual. To represent its value to society as a whole, we must be contented with an average.

Then the question arises whether this average value of a dollar should remain constant in order to make it the best possible standard of deferred payment. Contrary to the views commonly expressed, I would question whether, from the standpoint of social welfare, a unit of constant average value would be the ideal standard of deferred payment. Suppose a few members of a community to grow very rich, so that the

[1] Walras (pp. 463, 464) proves mathematically the evident truth that the mean of the variations of prices does not indicate the variation in the value of money, but the relation between the variation in the value of money and the mean of the variations in the values of commodities. See also, Pareto (*loc. cit.* sec. 389). This is the fundamental error in the numerous methods of measuring variations in the value of the monetary unit by averaging prices through index numbers. Investigations through index numbers are very useful in determining the course of general movements in prices. They show changes in the relationship of money to commodities, but do not show the absolute changes in the value of either money or commodities.

[2] A commodity always goes to the one who will pay most for it. So the price of anything does not depend upon what would be its marginal subjective utility to society, its natural value as Wieser would say, but upon the smallest offers that can be satisfied with the available supply.

dollar represents much less value to them than formerly; in that case ought the coinage to be restricted, or some other means be resorted to for increasing the value of a dollar to other people enough to keep the average constant? We see at once that this would work injustice to the debtor class. We do not think it unjust if the dollar represents somewhat less toil and anxiety now than it did a few decades ago.

Of course fluctuations in the value of currency are pernicious, and a sudden detraction from its value would be robbery, but it may well be questioned whether the natural depreciation which comes from industrial progress is not more in keeping with justice and social welfare than a more strictly constant unit of value would be. President Walker has noticed that a gradually increasing currency is conducive to prosperity, and Professor Ross presents strong reasons for the claim that the debtor rather than the creditor class should reap the benefit of industrial progress. Of course the debtor whose economic standing has fallen would still suffer hardship in paying his debt. That is one of the punishments which society imposes upon the unsuccessful. But the debtor whose economic standing has remained stationary would not be obliged to pay back more in personal value than he had received on account of the success of other members of society.[1] If society were in a static condition, the best standard of deferred payment would doubtless be a unit whose average subjective value remained constant, but in a progressive society a slightly depreciating standard seems just as fair, and we may at least conclude that the subject of a just standard of deferred payments would not be entirely settled by the determination of a perfectly constant unit of average subjective value.[2]

[1] Prof. Clark says (*Political Science Quarterly*, Sept. 1895, p. 398): "If a unit of currency conforms to the amount of commodity secured by a day of labor it will be an ideally right one; for it will divide equally between debtor and creditor the gains that come through industrial progress."

This proposition supposes the working day to grow shorter and less burdensome, while its product increases.

[2] As the social estimate of a dollar must be an average of individual estimates, so the standard of deferred payment must be of constant value or otherwise according to an average of individual estimations. It might seem therefore that justice would require a standard of constant average value, not to society as

Inasmuch as the average subjective value of a dollar cannot be exactly determined on account of the difficulty in measuring or comparing the feelings of different people, it becomes necessary to judge of value movements by such external signs as are available.

Adam Smith regarded the quantity of labor which is willingly given for anything as a true measure of its value. He speaks of labor as "the only universal as well as the only accurate measure of value, or the only standard by which we can compare the values of different commodities at all times and at all places."[1]

This statement has been much abused by economists who have not understood it, and it cannot be understood by any one who looks upon value from the standpoint of commodities. There is no constant relation between labor and commodities, but the relation between labor and personal sacrifice is perhaps as constant as any of the quantitative relations which we find in our ever-changing economic life.

a whole, but to those individuals who are concerned in debts and credits, and that in forming the average, each man's personal estimate of a dollar should be weighed by the number of dollars which he has at stake in debts and credits.

Compared with such a standard, we cannot doubt that the value of gold is depreciating, although the complaints against the gold standard are made altogether on behalf of the debtors.

After all, the question whether the commercial standard of value is really appreciating, depreciating, or constant in value is of far less importance than the requirement that its value should be free from fluctuations and uncertainties. A steady movement, whether upward or downward in the value of the money unit, will be adjusted in the credit contract, but uncertainty in regard to the standard causes risks and results in loss to both debtors and creditors.

Prof. Frank Fetter, in an article upon this subject in the *Annals of the American Academy* for May, 1895, says that the question of a just standard of deferred payment "has not received and is not likely to receive a positive answer from pure economic theory."

[1] Prof. Sidgwick, in his "Scope and Method of Economic Science," quotes this passage, though incorrectly, and asserts that "a tyro can now see the fallacy of Adam Smith's statement."

It is true that labor is hardly a practicable measure of the objective exchange value which Prof. Sidgwick has in mind, but even for exchange value the statement is not altogether fallacious if, as Adam Smith proposed, "the different degrees of hardships endured and of ingenuity exercised be taken into account." For what better criterion of the exchange value of an object can we have than the services which the object will command?

In regarding labor as a perfect measure of value, Adam Smith was doubtless wrong, whether the subjective or the objective standpoint be taken. Viewed from the subjective standpoint, quantity of labor could be so defined as to be equivalent to quantity of sacrifice, but as we have seen, it is not the total sacrifice of labor, but the marginal sacrifice, which corresponds to the marginal utility and value of the earnings.[1]

Among the tangible signs of changes in the value of the monetary unit an important place must doubtless be given to price movements as indicated by the use of index numbers, but it must be remembered that while a general movement in prices may indicate a change in the value of money it does not necessarily constitute such a change. A price is but a ratio between two values and will be equally affected by a change in either term and both values may change without affecting the ratio.

Doubtless an index number could be so made up as to be a much better criterion of the importance to men of a dollar's worth of goods, but this desideratum has hitherto received comparatively little attention.[2]

[1] The sluggish negro basking in a southern climate values the dollar less than the energetic artisan, though labor on the whole is more irksome to him. The artizan, however, continues work till its final disutility to him is greater.

[2] A vague idea of this sort seems to underlie the choice of the consumption standard or the income standard instead of a more general system of prices. See Prof. Edgeworth "On Variations in the Value of the Monetary Standard," *Report of the British Association for the Advancement of Science*, 1889, and the article on "Index Numbers" in Palgrave's *Dictionary*. A nearer approach was made by Prof. Marshall (quoted by Prof. Edgeworth, *loc. cit.*), when he spoke of "the real value of gold" as measured by its power "of purchasing labor of all kinds—that is, not only manual labor, but the labor of business men and all those engaged in industry of any kind."

It is evidently with the subjective nature of value in mind that Prof. Newcomb, *Principles of Political Economy*, p. 210, says: "We might assume that the absolute value of everything produced by the population of the country remains unchanged except that as population increases the total value produced increases in the same ratio. In other words, we may suppose the average productiveness [in real value] of each individual to remain the same from year to year." Again Prof. Newcomb says, p. 213: "One source of error in drawing conclusions from such a table [a multiple standard table] can be more easily seen than avoided. The improvements constantly being made in manufactures lead to their being really cheaper when measured in terms of human labor, which is our proper ultimate standard. This improvement should be allowed for, if possible, by increasing the quantities in our standard collection."

The subjective standpoint has been maintained throughout the preceding discussion. The article has chiefly considered the nature and measurement of the value of the monetary unit. By a well-founded habit we express all values in our ordinary economic life in terms of the monetary unit. The explanation of the way in which these different money values come to be assigned to different commodities belongs to the theory of prices, and cannot be considered here. But before we can know the significance of a price or value as ordinarily expressed, we must know the value of the monetary unit. All other values are expressed in dollars and cents. If we can find the value of a dollar by referring to its subjective importance, we have the key to the whole system.

We find the subjective importance of a dollar varies with one's wants and economic condition, and, to each individual, is determined by the marginal utility of his money to him, or—what amounts to the same thing—by the disutility of earning money at the point of time when that disutility is just offset by the utility of the earnings.

We find that the wants of the different members of society are not satisfied in the order of their urgency, and, therefore, properly speaking, there can be no such thing as a final degree of utility to society as a whole. It appears, therefore, that the value of the dollar to society can be but an average of its values to the individuals who compose the society.

If the average value of a dollar is to remain constant, the average of its final utility to different members of society must remain constant, or, what amounts to the same thing, the average disutility of earning a cent at the point of time when that disutility is just balanced by the utility of the cent must remain constant.

However, there is reason to doubt whether a unit of such constant average subjective value would be the best standard of deferred payments.

On account of our inability to accurately measure the subjective feelings of other people, our main reliance must be upon a careful use of the labor standard for comparing the subjective value of the monetary unit to different individuals and to different generations.

D. I. Green.

Hartford, Conn.